Chapter 3. Vietnam's Rice Market

3.1 Introduction

This chapter will provide some major information about Vietnam's rice market. First of all we need to study in more detail the history of Vietnam's rice economy, and analyze the progress of agricultural reform (Doimoi) in Vietnam. This chapter will summarize the progress of rice market liberalization including a description of the rice cropping and production system; changes in rice productivity after policy reform; the operation of the rice market system; and behavior of rice farmers and consumers. Finally, this chapter gives an overview of world rice production and trading in order to discover the impact of the world rice market on the performance of Vietnam's rice market.

The methodology used in this chapter involves the analysis of secondary data of the rice industry in Vietnam. Moreover a survey of rice farmers in selected provinces in the Mekong River Delta was designed to retrieve recent data on marketing behavior of farmers.

3.2 Overview of Vietnam's rice economy

Vietnam's agriculture occupies 28.4 percent of the country's natural land area of 32.9 million hectares (2001). Vietnam has an extremely small area of arable land per capita (1,073 square meters per person); it has two main granaries - the Mekong River Delta in the South and the Red River Delta in the North. The soil and topography of the country make it suitable for the cultivation of tropical as well as subtropical crops. However, agriculture has always been dominated by wet rice cultivation. Among the other foods, maize, cassava, and sweet potato are most important.

Vietnam's food crop production, more than 85 per cent of which consists of rice, continues to be the largest share of the gross agricultural output and the focus of agricultural policy concerns. More than 70 per cent of the rural population depends on food production for their main source of income. On average, the value of gross agricultural output - including animal and fishery products - contributes 49 percent of GDP and 42 percent of the current total export value.

Facing persistent low productivity and food deficits, the Vietnamese government initiated a series of policy reform measures (See the following sections below) in the 1980s aiming at boosting production incentives, which resulted in a doubling of paddy output (26.4 million tons in 1996 compared with 12.4 million tons in 1981, Table 3.1).

The 1981 and 1988 economic reforms in Vietnam's agriculture have been widely recognized as the factor underlying the recent boost in rice production and exports. Rice yield per hectare and total rice production, which had almost stagnated in the period 1976-80, turned to have annual growth rates of 3.23 and 3.14 respectively in the period 1981-87, and 2.80 and 5.19 respectively in the period 1988-96 (Table 3.3). Annual per capita rough rice output remained at almost the same level of 270 kg in the period 1976-81 but increased by approximately 30 kg and 40 kg in five and seven years of the periods 1981-85 and 1988-96 respectively (Table 3.1).

Economic reforms in agriculture in Vietnam (which will be discussed in detail in Section 3.4) consisted of a shift from a collectivized agricultural production system to an individual-oriented contract system and later on to the complete liberalization of input and output markets, allowing individual farm households to make decisions on resource allocation, crop choices and crop management. The increase in rice productivity (in terms of rice yield per hectare) in the period 1982-1987 and the subsequent rice export boom in 1989 reflect the farmer's response to policy change.

Climatic and soil conditions as well as the level of development differ substantially among regions in Vietnam. Rice is the main food crop in all the regions but its contribution to regional total food crop output varies. Table 3.2 shows that the northern mountains and midlands, the northern central coast, the central highlands, and the southeastern region have per capita food crop outputs below 250 kilograms; the figure of the Mekong delta was 775 kilograms in 1994. Per capita rice output of the above regions was below 200 kilograms while per capita rice output of the Mekong delta was 799 kilograms in 1995. The pattern of rice consumption also differs across regions. While rice is the staple food for the Vietnamese, the proportion of other complementary food crops in the everyday diet varies between regions. The population in the northern mountains and midlands and the northern central coast uses more corn and other root crops to supplement their daily diet, especially during slack seasons of rice harvest.

Table 3.1 *Vietnam staple food production and food availability 1976-2000*

Year	Total production		Rice cultivated area [2]	Rice yield [3]	Population	Per capita production		Rice import	Rice export	Food grain import	Per capita availability [4]	
	Grain [1]	Rice				Grain	Rice				Grain	Rice
	(1,000 tons)		(1,000 ha)	(Kg/ha)	(Mil.)	(Kg)		(1,000 tons)			(Kg)	
1976	13,493	11,827	5,297	2,233	49.2	274	241	148	0	634	194	159
1977	12,622	10,597	5,469	1,938	50.4	250	210	196	0	1,096	188	158
1978	12,265	9,790	5,463	1,792	51.4	239	190	285	0	1,395	187	129
1979	13,984	11,363	5,485	2,072	52.5	267	217	320	0	1,576	209	146
1980	14,406	11,647	5,600	2,080	53.7	268	217	210	33	890	194	144
1981	15,005	12,415	5,652	2,197	55.0	273	226	12	0	452	185	146
1982	16,829	14,390	5,711	2,520	56.2	300	256	197	0	370	204	169
1983	16,986	14,743	5,611	2,628	57.4	296	257	42	0	85	194	167
1984	17,800	15,506	5,675	2,732	58.7	303	264	140	0	359	205	171
1985	18,200	15,875	5,704	2,783	59.9	304	265	336	59	422	209	176
1986	18,379	16,003	5,689	2,813	61.1	301	262	482	125	528	210	176
1987	17,563	15,103	5,589	2,702	62.4	281	242	323	120	469	193	160
1988	19,583	17,000	5,726	2,969	63.7	307	267	465	91	464	212	179
1989	21,516	18,996	5,896	3,222	64.7	334	295	55	1,372	183	198	170
1990	21,489	19,225	6,028	3,189	66.2	324	290	20	1,478	168	189	164
1991	21,990	19,622	6,301	3,114	67.6	324	289	6	1,061	255	199	172
1992	24,215	21,590	6,423	3,361	69.3	349	312	0	1,953	282	203	174
1993	25,501	22,836	6,559	3,482	71.0	359	321	0	1,649	265	212	184
1994	26,198	23,528	6,598	3,566	72.5	361	324	0	1,962	260	211	184
1995	27,571	24,926	6,766	3,684	73.9	372	337	0	2,025	na[5]	225	191
1996	29,218	26,397	7,021	3,760	75.2	388	351	0	3,047	na	232	198
1997	30,618	27,524	7,100	3,880	76.7	399	359	0	3,682	0	235	202
1998	31,853	29,142	7,362	3,990	78.1	408	373	0	3,793	0	238	205
1999	34,524	31,390	7,465	4,205	79.5	434	395	0	4,550	0	241	208
2000	35,625	32,554	7,655	4,253	80.9	440	402	0	3,500	0	240	207

Note: [1] Grain: included rice, maize, wheat.
[2] Cultivated area: total area that yielded two or three rice crops per year.
[3] Yield: average rice yield per hectare of cultivated area.
[4] Per capita availability: per capita production minus reserved stock variation for food security program. [5] Not available.
Source: General Statistic Office, Hanoi, 2001.

Table 3.2 *Per capita food grain and rice output by region, Vietnam 1976-1995*

Region	I	II	III	IV	V	VI	VII
			Per capita total food grain output (Kilograms)				
1976	243	273	216	207	270	130	455
1980	225	223	185	243	298	155	453
1985	249	255	229	304	290	156	512
1990	230	294	226	274	224	123	658
1991	205	261	222	289	225	129	703
1992	239	347	234	258	221	116	727
1993	261	390	236	235	217	130	721
1994	239	328	237	269	222	150	775
1995	238	355	254	258	212	145	809
			Per capita total rice output (Kilograms)				
1976	187	255	175	170	180	93	437
1980	155	178	125	174	163	84	436
1985	186	233	183	247	180	110	503
1990	170	260	186	235	149	100	649
1991	137	229	180	249	160	101	695
1992	170	303	191	220	153	89	719
1993	190	350	193	199	152	101	713
1994	178	293	197	237	150	105	765
1995	179	323	213	227	136	100	799

Note: I: Northern Mountainous & Midlands; II: Red River Delta; III: Northern Central; IV: Southern Central; V: Central Highlands; VI: Eastern Mekong Delta; VII: Mekong Delta.
Source: General Statistic Office, Hanoi, 1997.

3.3 Rice production system

In this section, an overview of the rice production system in different regions of the country will be presented. Additionally, we also describe some main characteristics of rice farmers in the Mekong River Delta.

3.3.1 The description of rice growing seasons

Due to the long length of the country and the resulting weather differences, rice-growing seasons vary from the North to the South. However, the large irrigating network blurs the boundaries between seasons in the South.

Rice growing seasons in the South

In the South, there are two seasons: the wet and the dry season. The wet season runs from May to November. In the wet season, the monsoon gradually begins in April, sharply increases in late May and remains heavy in June – October. Rainfall

levels are relatively high, but diminish in November (the majority of the 2,000 mm of rainfall occurs between June and November). The dry season runs from December through late May - early June.

Depending on the ecosystem (irrigated or rainfed), there are two rice cropping patterns during the wet season in the South of Vietnam:

(1) In the irrigated areas, the farmer produces both a "Summer-Autumn" and an "Autumn-Winter" rice crop
   - The "Summer-Autumn" rice crop or early rainy season crop ("*He thu*") is planted in April-early June and harvested in July-early August; it is planted on irrigated areas with high yield varieties.
   - The "Autumn-Winter" or late rainy season crop ("*Thu dong*") is transplanted in August and is harvested in November – December; it is also planted on irrigated areas with high yield varieties.

(2) In the rainfed areas, the farmer produces the "main wet season" crop ("*Mua* crop"). This is a rainfed lowland crop planted with traditional varieties in July - August. They have various growing durations: early (harvested in late-October - early November); medium (harvested in late November - December); and late (harvested January - February).

During the dry season, in the irrigated areas, the farmers grow "Winter-Spring" or dry season crop ("*Dong xuan*"). It is planted in November - December and harvested in February - April with the bulk of the crop cut in February.

In sum, in the South, in the irrigated areas there are three rice crops per year: "Summer-Autumn"; "Autumn-Winter"; and "Winter-Spring". In the rainfed lowland areas there is only one rice crop per year – "Main wet season", which is planted with traditional varieties (See Figure 3.1).

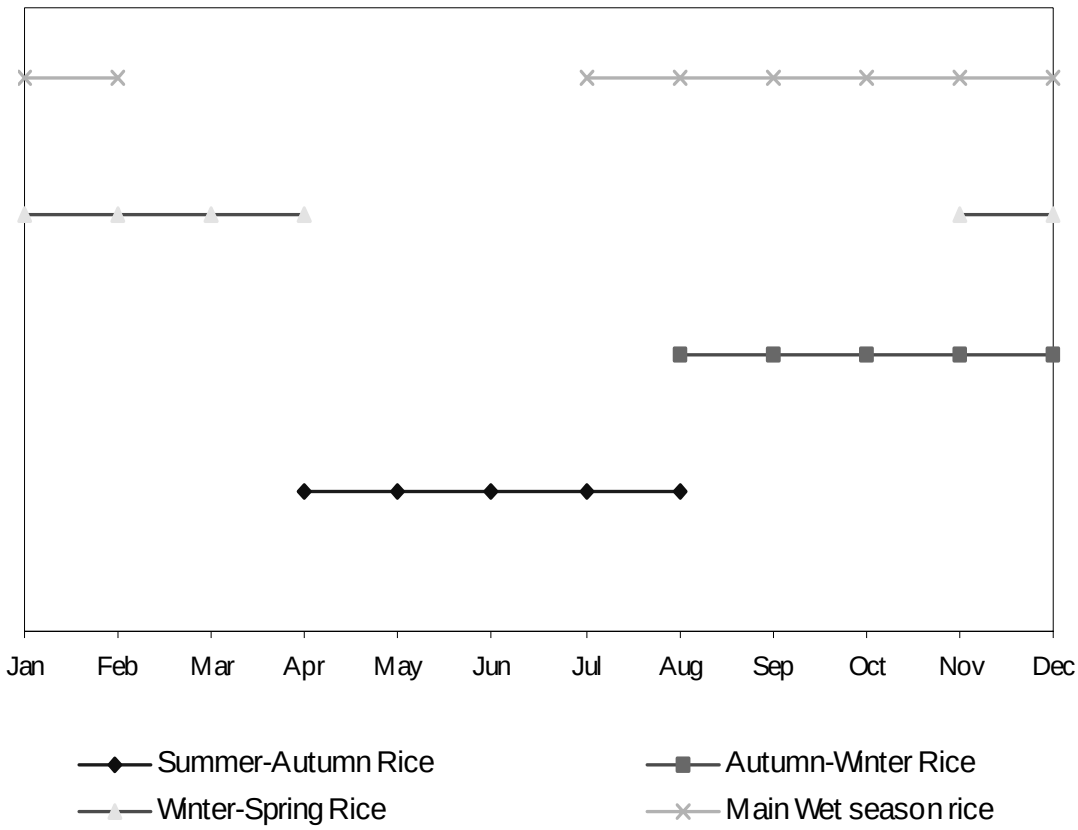

Figure 3.1 *Rice growing seasons in the South of Vietnam*

Source: Department of Agriculture and Rural Development of Cantho -Vietnam

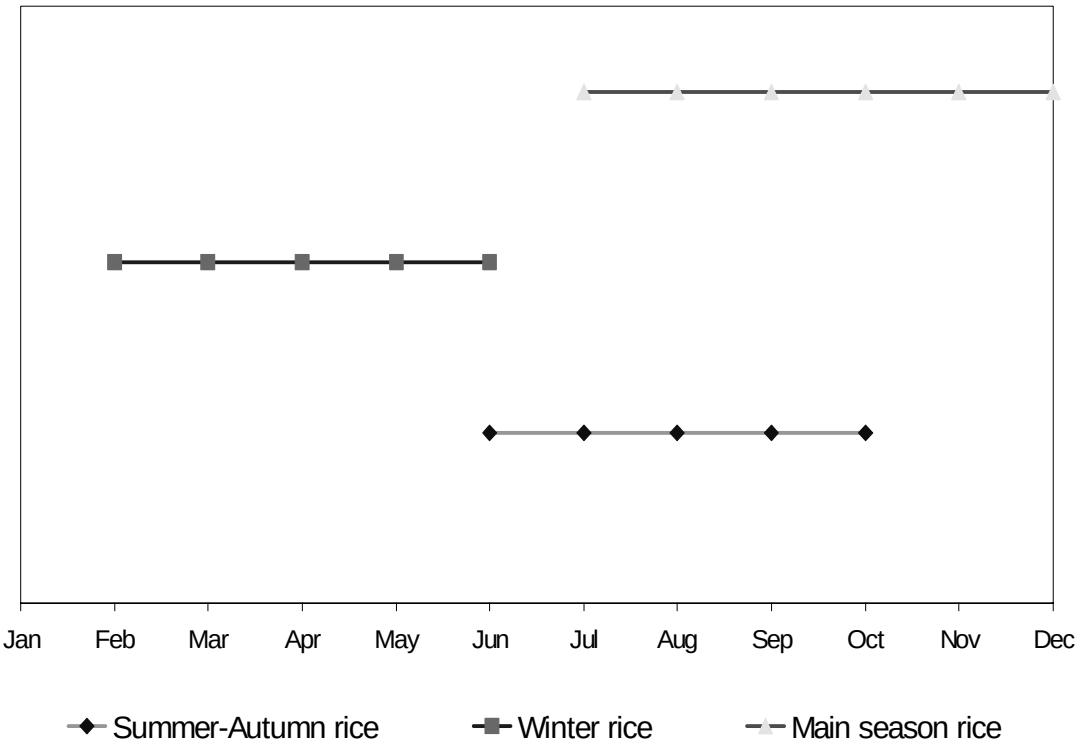

Figure 3.2 *Rice growing seasons in the North of Vietnam*

Source: Department of Agriculture and Rural Development of Cantho -Vietnam

Rice growing seasons in the North

In the North, which usually has a rice deficit, double cropping is the norm. Northern Vietnam has four rather distinct seasons, although it is influenced also by the Southwest monsoon. The monsoon begins in the North in mid-April and reaches a peak in August - September. Rainfall levels fall sharply in October - November as the monsoon ends in late-October/early-November. The dry season is from November to early-April. December to March is cool with short cold spells; Northern and central Vietnam are particularly vulnerable to typhoons in the July- October period, especially in the beginning and ending months of this 120-day period.

Based on the characteristics of the weather as mentioned, the cropping pattern in the North is as follows: (See also Figure 3.2).

The "Winter crop" ("*Chiem xuan*") is equivalent to the South's "Winter-Spring" crop. It is transplanted in February and is harvested in June. These same areas are replanted with the "Main season crop" ("*Mua* crop") in July and harvested in late October-November. In some minor areas of the North, the "Summer-Autumn" crop ("*He thu*") or early rainy season is planted instead of the main season crop in order to free the land soon enough for planting a cash crop. Overall, however, the amounts produced of the "Summer-Autumn" crop are small in the North.

3.3.2 Irrigated lowland rice and irrigation systems

Irrigated lowland rice represents the most important ecological rice production system in Vietnam; it is concentrated in the two deltas, the Red River Delta (RRD) in the North and the Mekong River Delta (MKD) in the South. [10]

Government investment in irrigation occupied the largest outlay of total public investment. About one half of the outlay was borne by the central government and the other half came from provincial government budgets. In addition, from 1988 to 1992, foreign aid provided about 45 million US dollars for irrigation projects, equivalent to approximately 50 percent of government irrigation budget of the period 1986-90.

Currently, Vietnam has an irrigation system to support 2 million ha of year-round agriculture and 400 thousand ha for one crop per year. Some 850 thousand ha are serviced by drainage schemes and 450 thousand ha are drained by electric pumping. Of the irrigated land, 20 percent is in the RRD and 40 percent in the MKD. On average, the irrigated area increased by 122 thousand ha per year in 1976-80, 62 thousand ha in 1981-85, 70 thousand ha in 1986-90 and

[10] Rice output of the two deltas accounts for 69 percent of the country output. Eighty percent of rice areas in the RRD are irrigated while this figure in the MKD is about 40 percent (Goletti and Minot, 1996).

50 thousand ha in 1991-95. A further 40 thousand ha per year were brought into cultivation through drainage projects (Table 3.3). Of the total of 7 million ha sown with rice in 1998, 6.3 million ha were irrigated: 2.5 million ha of spring rice, which is a dry-season crop, 1.7 million ha of autumn rice, and 2.1 million ha of the main wet-season rice crop (Table 3.4).

The drainage system has been particularly important in the RRD, which is more vulnerable to excessive rainstorms than the MKD. Although this system is well developed, 100-150 thousand ha are still subject to flooding during heavy rainfalls. The Red River irrigation system is a network of high dikes to hold back monsoon floods, pumping stations, and canals to drain excess waters in the wet season and provide irrigation in the dry season, enabling two crops of rice to be grown in most of the Delta. Much of the irrigation and drainage system in the RRD is old and suffering from degradation, which demands costly repairs, especially for the system of pumping stations.

Table 3.3 *Total added irrigated area (construction capacity) 1976-1995.*

Period	Irrigated		Drained	
	Total area added	Average annual increase	Total area added	Average annual increase
		(Thousand hectares)		
1976-80	608.3	121.7	244.6	48.9
1981-85	309.8	62.0	186.3	37.3
1986-90	352.5	70.5	203.5	40.7
1991-95	253.0	50.6	149.0	29.8
1976-95	1,523.6	76.2	783.4	39.3

Source: Statistical data on irrigation development. Ministry of Irrigation and General Statistical Office, Hanoi, 1996.

Table 3.4 *Total irrigated rice area by crop-season,1976-1998.*

Period	Total	Spring rice	Autumn rice	Main rice
		(Thousand hectares)		
1976	3,251	1,203	317	1,731
1980	3,736	1,582	437	1,717
1985	4,472	1,689	791	1,992
1990	5,045	2,011	1,127	1,907
1995	5,787	2,120	1,542	2,125
1998	6,310	2,483	1,689	2,138

Source: Statistical data on irrigation development. Ministry of Irrigation and General Statistical Office, Hanoi, 1999.

The existing system in the MKD operates mainly as an irrigation source, with transport of water to the fields being the responsibility of the farmer. The canals serve a dual purpose: as an irrigation-drainage system and for transport. After 1975, a plan was developed to build a series of large pumping stations similar to the pattern in the RRD; however, it soon became inappropriate. A system of canals and dikes to bring irrigation water and control floodwater is being developed. Farmers in the MKD construct minor canals and dikes to control water in their fields.

The opportunities for a substantial increase in the irrigation infrastructure are limited in both the Red River and the Mekong Delta. In the Red River Delta, there is little land suitable for irrigation that has not already been developed. Land available for reclamation usually suffers from poor drainage, and requires pumping. Subsidies on electric power for pumping are being phased out, making the reclamation of inferior land unprofitable (IBRD, 1993). The priority for irrigation development in the Red River Delta will be mainly in the rehabilitation of existing systems rather than adding new areas.

In the case of the Mekong Delta, expansion of the irrigated area is constrained by prolonged and extensive flooding in the Southern parts of the Delta and the prevalence of acid sulfate soils. The best opportunities for expanding irrigated rice production are in the deepwater areas, where a double crop of irrigated rice could be grown using pump irrigation. Even in the latter case the areas involved would not be more than 500 thousand hectares. Further conversion of deepwater rice areas to irrigated double rice cropping is constrained by growing environmental concerns about expansion in the irrigated area, and by the relatively higher profitability of rice-aquaculture systems that typify flood-prone environments.

Central Vietnam has the largest potential for expansion of the irrigated area. The government estimates that 400 thousand hectares of rice lands can be irrigated through the development of gravity irrigation systems. However, the developmental and environmental costs of such projects could be very high (IBRD, 1993).

Irrigation fees paid by farmers varied greatly across regions and across irrigation stations. The average fee collected by district irrigation stations operating on electric pumps was 140-kg paddy per hectare. If the irrigation station only provides water and the task of bringing water to the fields is left to farmers; the average fee was 63 kg paddy per hectare. The average fees collected by provincial irrigation companies were much higher, 212 and 137 kg of paddy per hectare respectively. [11]

[11] Irrigation fees were mostly paid in cash.

3.3.3 The upland rice production system

Arraudeau and Xuan (1995) stated that in Vietnam, in 1993 450,000 hectares were cultivating upland rice [12]. It is planted mainly as a major food crop in the humid forest zones by more than 50 ethnic groups, most of which are nomadic and practice shifting cultivation. The total affected area is about 8 million ha, where some 3 million ethnic people are living.
The annual rainfall varies from 1,300 to more than 2,000 mm, but the usual range is 1,400 - 1,800 mm. It is very erratic and droughts are common everywhere. The rainy season starts in April - May, or even as late as early June, generally peaks in July - August, and ends in October - December. It is more uniform in the center and in the south and varies greatly in the north, even over short distances, where a range in elevation of 1,000 - 2,000 m over a few kilometers can be found. Temperatures range from 15-25^{o}C in high-lying areas to 34-36^{o}C in low-lying areas during the cropping season.

Slash-and-burn with shifting cultivation is the predominant system. In the past, the fallow period was usually 12 - 15 years or more; however, it is now only 3-10 years because of increasing population pressure. Land degradation is an increasingly serious problem almost everywhere, but particularly in the north. For example, in the province of Cao Bang, most of the land is denuded, with only poor stands of grass and scattered forest remaining. Land ownership is rare, representing less than 5 percent of the area - lease holding is usual. Long-term lease was recently granted in some areas.

The area planted with upland rice is generally declining. Since the increase in 1980-85 because of food shortages, there has been a progressive decline. In the province of Bac Thai, 4,500 ha were reported in 1990, then 3,900 in 1991 and 3,700 in 1992, which is less than 0.5 percent of the total provincial area. In the province of Tuyen Quang, upland rice represents less than 1 percent of the total area of the province. It is more important in some provinces, such as LaiChau, but rarely exceeds 2 percent of the total area. However, the impact on the environment is much greater. Rough estimates give a total impact of 7-10 times more than the actual area of rice because of the slash-and-burn system with fallow rotation. Therefore, from 5 to 20 percent of the provincial areas is in fact concerned.

The slash-and-burn system involves cutting the vegetation in Mach-April, then burning. Rice is planted using a stick with 5-10 seeds/hole and holes 20-30 cm apart. No fertilizers at all are used and weeding is the only form of field management. A single weeding, taking 10-40 person-day/ha (usually about 20-25) is

[12] *lua ray* in southern Vietnam, *lua can* in the center, *lua nuong* in the north

done. Farmers rarely do more, even when weeds are becoming serious. Harvesting is by hand, using sickles or small knives, or by stripping the panicles and the harvest is stored on-farm in traditional granaries. The yield varies from about 0.6 up to 2 tons/ha and declines rapidly after the first year. After 2 or rarely 3 years, the farmers abandon the land, which then lies fallow, and restart the cycle elsewhere.

In the slash-and-burn system, traditional cultivators are exclusively planted and it is estimated that there are probably more than 400 varieties in the country. Most of them are sticky varieties, with low amylose contents; some are *nep*, meaning glutinous, and are mostly used for producing liquor. They appear to belong predominantly to the upland tropical japonica group - panicles are long to very long; grains are medium to large, relatively low in number, and frequently awed; tillering is low; and the maturity period is mostly 100 - 160 days. Several varieties are sometimes mixed in the same field, but usually they are grown more or less pure. Inter-cropping with a different crop is infrequent, although maize is sometimes planted.

The major yield-limiting factors reported everywhere are poor soils and drought, weeds, diseases, and pests - mainly various species of insects, depending on the area – are also noted.

3.3.4 Production and marketing activities of rice farmers

Rice producers interviewed in this study were only private farmers who produced paddy on their own lands (in the Mekong River Delta, private farmers are the majority, it was more than 75 percent of the total [13]). The farmers of the agricultural co-operatives were not considered.
In this study area, more than 30 percent of the farmers grow two rice crops per year, while others grow three crops on the field with good water control. The existing three alternative rice cropping systems are:

- Winter-Spring and Summer-Autumn crop
- Winter-Spring, Summer-Autumn and Autumn-Winter crop
- Summer-Autumn and "*Mua*" crop.

Beside rice cultivation, farmers in this surveyed area have also cultivated some other crops such as corn, sweet potato, soya-bean, and vegetables during the off-rice seasons (ex the break time between two rice crops). However, these crops were cultivated only on minor areas where no three rice crops per year can grow.

[13] Vietnam, Agricultural Statistical Year books 1999

According to the farmers interviewed, there were more than 10 different high yielding varieties to be used in this study areas namely, IR64, IR62032, OM404, OM504, MTL99, MTL250, AS996, CS2000, *Tai nguyen*, *Ham trau*, *Dai lo*, *Mot bui*, *Lun cam* [14], etc. On irrigated land, most of farmers planted a hybrid rice variety in both dry and wet season. Normally, almost all high yielding rice varieties were supplied by the Farming System Research Center of Can-tho University and The Cuulong Rice Research Institute (CLRRI). The rice farmers can receive new varieties through the Agricultural Extension Center of each province.

In general, after harvesting, most of the farmers will dry their paddy by sun-dry in the dry season (Winter-Spring crop), or using a drying machine in the wet season (Summer-Autumn crop). Then they keep a reasonable amount of paddy for their home consumption, animal feeding, and sell the rest to rice traders/millers. However, in this study, there were exceptional cases that some farmers directly sell *"fresh-paddy"* on their field after threshing (the case of farmers in Soctrang province). In the case of selling *"fresh-paddy"*, there were two main reasons. First, during the wet season the weather is not favorable for sun-dry, the farmers have to use machines for drying their paddy and they have to pay drying costs [15]. In the case of poor farmers that produced small quantities of paddy, it is better to sell *"fresh paddy"* in order to receive cash instead of to bear drying costs. Secondly, some farmers that lack capital, they prefer to sell *"fresh-paddy"* directly after harvest because they need to pay back the input supplies that they have got from traders.

To give an impression about home consumption and selling activities of rice farmers in the Mekong River Delta, Table 3.5 will show some data.

[14] Of which, IR64, *Mot bui*, *Tai nguyen*, IR62032, OM404, OM504, are considered as the most popular varieties that rice farmers grow in the Mekong River Delta (from Nguyen Van Luat, CLRRI).

[15] In the dry season, most of farmers can dry their paddy by sun-dry with no drying costs. In the wet season, if using a dryer, the drying cost is around 70,000 to 80,000 VND per ton of paddy. According to the report of DANIDA project in 2000, more than 70 percent paddy in the wet season is dried by dry machine. However, only 25 percent of rice farmers has their own dryer, since for one normal dryer they have to invest from 35 – 40 millions VND.

Table 3.5 *Percentage of home consumption and marketed surplus of rice farmers in the Mekong River Delta, Vietnam, 1999 - 2000*

Province	Percentage of home consumption(*)	Percentage of marketed surplus
1. Tiengiang	27.80 [0.576]	72.20 [0.274]
2. Angiang	16.02 [0.747]	83.98 [0.196]
3. Vinhlong	23.50 [0.445]	76.50 [0.144]
4. Cantho	16.84 [0.690]	83.16 [0.163]
5. Soctrang	22.20 [1.086]	77.80 [0.339]
Average for whole surveyed areas	21.12 [0.723]	78.88 [0.232]

Note: (*) Volume of paddy keep as home consumption included also paddy use for feeding livestock and poultry, and reserve for seeding on next crop.
The figures in […] are coefficients of variation.

Source: Own survey, 62 farmers in the Mekong River Delta, 1999 – 2000

Table 3.6 *Rice production per household and marketed surplus of rice farmers in Vietnam, 1996*

Province	Rice production/ household (Kg)	Home consumption		Marketed surplus	
		Amount (Kg)	Percent of production (%)	Amount (Kg)	Percent of production (%)
Northern Upland	640	563	88.0	77	12.0
Red River Delta	971	368	38.0	603	62.0
Northern Central Coast	752	504	67.0	248	33.0
South Central Coast	941	593	63.0	348	37.0
Central Highlands	547	300	55.0	247	45.0
Southeast	879	396	45.0	483	55.0
Mekong River Delta	3,105	870	28.0	2,235	72.0
Vietnam	1,316	474	36.0	842	64.0

Sources: (1) Rice production per household: from Agricultural Statistics Year books of Vietnam, 1998
(2)Home consumption and marketed surplus: from Vietnam Living Standards Survey and IFPRI 1996.

If we compare Table 3.5 and Table 3.6, the percentage of rice production that is used for home consumption in this study was lower than in 1996 (21.12 percent as compared with 28 percent). Most of the surveyed farmers preferred to sell their paddy after harvesting, they don't keep it to feed livestock. Because nowadays feeding livestock and poultry like pig, chicken, duck …is very risky and raises low benefits. Some other changes in the behavior of farmers are observed. They prefer to sell all of their paddy after harvesting, since this is high quality rice that is used for export with a higher price, and they will buy back cheaper rice (usually 25 percent broken rice) in the retail market for their home con-

sumption instead of preserving their own paddy. In sum, the percentage of rice production that was marketed is higher than in the previous period. This finding is interesting for our study.

3.4 Policy reforms and rice productivity

3.4.1 The period before policy reforms (before 1981)

In 1956, after the liberation of the North, the new revolutionary government adopted the slogan *"land to the tillers"* thus ending the feudal era. In fact, land reform started in 1945 with the expropriation of feudal and colonial owners. The expropriation phase was followed up by the collectivisation phase from 1959, the nationalisation phase from 1980, then the privatisation phase from 1987.

The process of collectivisation started in the North in the mid-1950s. As early as 1955 pilot schemes had been conducted and co-operatives were scattered over the entire countryside of North Vietnam. Almost in every case the pilot scheme for setting up co-operatives was preceded by the work of the mutual aid teams in agricultural production.

In 1959, the land was collectivised and many People's Committees were created in the North. In turn, the People's Committees transferred the land to communes, to be cultivated by the agricultural co-operative movement. In the end of 1960, over 40,000 agricultural producers' co-operatives were formed by 2.4 million households. Also in 1960, more than 90 percent of the agricultural co-operatives represented the elementary type of the agricultural producers' co-operative. Land was used collectively. Out of the proceeds of co-operatives, farmers were compensated for the land, animals, and farm implements that they had contributed. The members were paid for their labour, and the surplus was put back into community services such as education and health after government dues had been deducted.

In the following decade, the agricultural producers' co-operatives were directly influenced by the 1965-1975 war. Co-operatives had to contribute money and products in order to maintain the armed forces. So, during wartime the co-operatives mainly aimed at distributing an average food ratio to everybody, thus abandoning the principle of distributing surplus according to supplied labour.

By 1975, the year of unification with the South, 95 percent of Northern rural households were members of agricultural producers' co-operatives cultivating 95 percent of agricultural lands and producing 92 percent of total agricultural output. The government started the mobilisation campaign for the "organization of the agricultural production towards socialist large-scale production". Many co-operatives enlarged their size of membership and land under cultivation through amalgamation processes, thereby reducing the number from over 40,000 co-

operatives to less than 20,000 co-operatives. Because of the lack of technical skills in agriculture and a weak management, they did not achieve the expected results. Instead of economies of scale, social diseconomies of scale were the result.

After 1975, several attempts were made to introduce collectivisation and forced co-operation in the South. To support this movement, land in Vietnam was nationalised in 1980. By 1980, around 1,750 co-operatives as well as 18,800 production teams were set up in the South. These units accounted for 50 percent of rural families and 36 percent of the cultivated area. Finally, all attempts proved to be largely unsuccessful. Often agricultural co-operatives were only created on paper, while members continued to organise the individual use of land supported within mutual help groups or work-exchanged teams. In the Mekong River Delta, these work-exchange teams included some 80 percent of all agricultural households.

In sum, during the period before 1981, the farmer income was independent of land: land belonged to the state. A co-operative management board controlled the co-operative. All farming activities of co-operatives were done by production teams, decision-making was done by the planning department of the Council Committee at National, Provincial, or District levels. All input distribution was centralised and controlled by a top-down approach. Based on this system, each worker was assigned "work-points" or "credit points" for the quality and quantity of work done each day, and payment at the end of the season was based on the number of work-points accumulated (This was called a "work-based contract system").

The policy system created some problems. The number of working hours did not reflect the difference in quality of work; it was hard to judge the actual quantity of working hours and this led to conflicts among team members. The input supply system resulted in highly administrative overhead adding to the costs of input and in untimely input supply. Moreover "the work-based contract system" did not encourage farmers to work effectively; they paid more attention to their household economy. The food shortage became serious because rice production was low.

In order to solve the above disadvantages of the "work-based contract system", the directive No.100 was issued in 1981 by the government, which is the starting point of policy reforms in the agricultural sector in Vietnam.

Two sets of policy reforms were behind the recent rice export boom in Vietnam. The first set, initiated two decades ago, involved the switch from a collectivized agricultural production system to a household-oriented *"contract system"* of production. The second set of policy reforms, initiated in 1988, helped to further liberalize the agricultural sector and restore producer incentives. A detailed account of the policy reforms and their impact can be found in Pingali and Xuan (1992).

3.4.2 "Contract System" of Production (1981)

Faced with large food deficits and declining productivity, Vietnam switched from a collectivized agricultural production to a household-oriented contract system of production in 1981. The "contract system" was applied to individuals or groups of laborers within the agricultural producers' co-operatives. The agricultural co-operatives were responsible for supplying fertilizers, seeds, and insecticides; arranging for draft animals or tractors for land preparation; coordination, irrigation, and water supply. The members were responsible for transplanting the rice seedling, weeding and harvesting. Due to bureaucratic inflexibility, the agricultural co-operatives were not able to fulfil their responsibilities in time, thus making it practically impossible for the peasants to increase land productivity. In reality, the peasant members had to do all the work and were not supported by their co-operatives with timely input supplies.

In summary, during this period, the collectivized production was well entrenched in Northern Vietnam, where all production was carried out by production teams using communally owned equipment, and payment was based on the work point system (as mentioned above). In Southern Vietnam, on the other hand, attempts at collectivization were not that successful. Production activities continued on a family farm basis and collective effort was made only for obtaining inputs and marketing output. Collectivization attempts failed to fulfil the stated objective of rapid food productivity growth. In fact, the growth in aggregate rice output was at its lowest level during the period 1976-1980 (Table 3.7). The failure of collectivization can be attributed to policies that disregarded producer incentives and disrupted market mechanisms for the flow of inputs and outputs. (Pingali and Xuan, 1992).

Table 3.7 *Rice production performance, 1950-2000.*

Period	Growth (percentage per year)			
	Cultivated area [1]	Yield per hectare	Total production	Cultivated area per capita
1950-55	2.79	0.47	2.50	na [2]
1956-65	0.33	2.30	2.63	na
1966-75	1.59	2.22	3.80	na
1976-80	1.02	-0.55	0.46	-0.97
1981-87	-0.09	3.23	3.14	-2.28
1988-96	2.39	2.80	5.19	0.48
1997-00	2.19	3.12	5.77	0.74

Note: [1] Cultivated area: total area that yielded two and three rice crops per year. (Total cultivated area x average rice yield = total rice production).
[2] Not available.

Source: Agricultural Statistics, General Statistics Office, Hanoi (2000)

The contract system of production was designed to improve producer incentives and thereby increase productivity. In this system, individual households enter into a contract with the collective to produce a certain level of output on their land. The contracted output had to be sold to the state at a fixed price. All output beyond the contracted amount could be kept for home consumption or sold to private traders.

The introduction of the contract system of production had a significant impact on food output growth between the years 1981 to 1987 when it started to level off. Aggregate rice output grew annually at the rate of 3.14 percent during 1981-87 as compared to 0.46 percent for the 1976-80 time period (Table 3.7). Most of the output growth can be attributed to an increase in yields per hectare per crop rather than an expansion in area cultivated. This result was suitable with the real situation in practice. After the war, during the period from 1976-80, the farmers were encouraged to produce more rice in terms of increasing rice area (quantity factor). Therefore, most of the available land was used to produce rice. As a result of the policy reforms (contract system as mentioned above), better conditions were created for rice production: availability of improved technology for rice cultivation, an improved irrigation system, availability of new high yielding rice varieties, etc. So, during this period an increase of rice yield (quality factor) was the main factor that led to the growth of rice production. In the Southern provinces aggregate rice output grew by over 2.5 million tons from 1980 to 1987. For the same period, the corresponding increase in the northern provinces was around two million tons (Khiem 1995).

Pingali and Xuan (1992) provide an econometric estimate of the productivity impact of switching from collectivized agricultural production to the contract system. The switch to the contract system was estimated to have resulted in a productivity jump of 12 percent and 16 percent respectively for the Northern and Southern provinces. By 1989 Vietnam was producing 91 percent of its food requirements as compared to 73 percent in 1980 (UNDP, 1989). Figure 3.3 show the trend in Vietnam's rice production from 1976 to 2000 (as presented in Table 3.1). This figure illustrates that the contract system of production had a significant impact on rice output growth between the years 1981 to 1987.

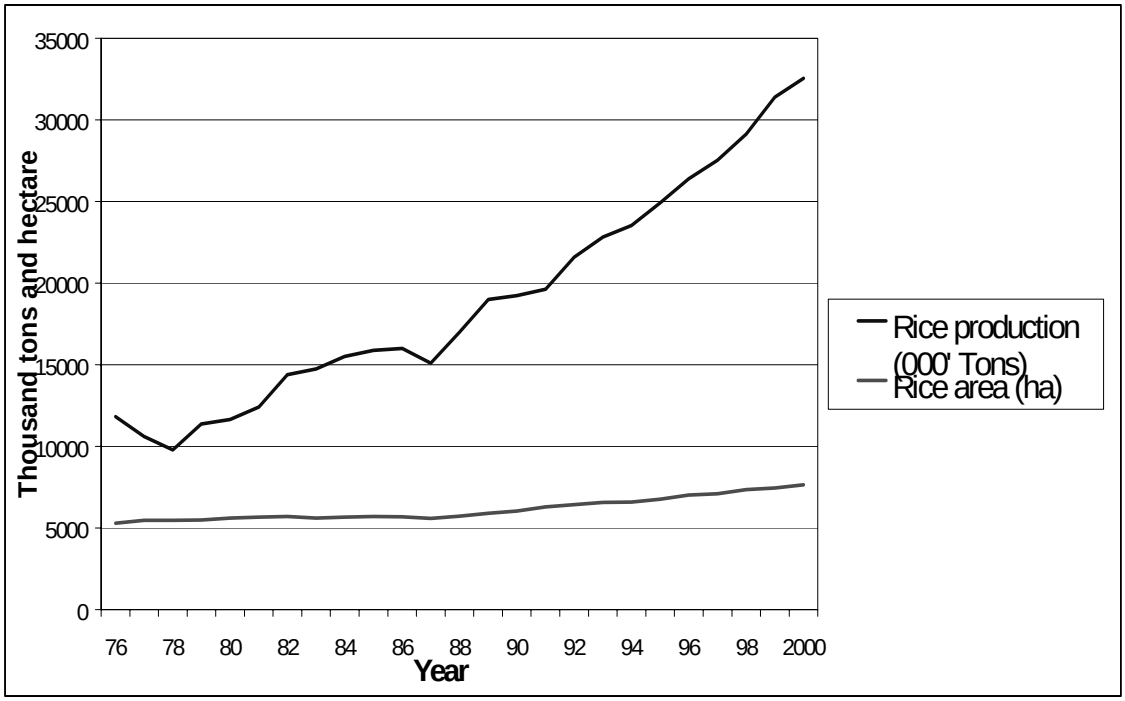

Figure 3.3 *The trend of rice production and rice area in Vietnam, 1976-2000*
Source: General Statistic Office, Hanoi 2001.

The success of the contract system could not be sustained over the long term due to the following reasons. a) Land use and crop choice decisions were still being done by the State Planning Commission in the traditional top-down approach, without consideration of farmer preferences and local market conditions; b) the government often failed to collect all of the contracted grain at harvest time due to financial difficulties; c) as a consequence of (b), seasonal surpluses at the farm gate led to a crash in the private rice price in several regions, which, while benefiting the urban poor, had severe disincentive effects on the farmers; d) the persistence of centralized input supplies resulted in inadequate and untimely provision of inputs to the farmers; and e) lack of land tenure security resulted in inadequate farm level investments for maintaining long term land productivity.

To overcome those shortcoming mentioned above, in 1988 the government released resolution No. 10 – "the latest reform in 1988". The new policy contains three major issues as follows

3.4.3 The "latest reform" in 1988

Land allocation

The resolution number 10, assigned land to the farmer for 10-15-20 year's terms on the basis of a renewable lease. The assignment of land to the family, rather than to an individual, implies that land remains within the family. The farmer cannot be displaced from his land without his consent and without fair compensation for the cost of land development. They are now free to decide what to produce, how to produce it and how to market their farm products. The role of the co-operatives has also changed. Their functions are limited to services like irrigation management, technical know-how transfer etc. Production teams were replaced by peasant households which became the basic units of agricultural production.

Privatisation of output markets and introduction of the land tax

Starting in 1989, farmers no longer are required to sell a quota amount of rice to the State. The individual family will have the right to own all products generated by it after subtracting taxes and commission to the board of collectives to pay for their services. Farmers are required to pay a tax based on the assessed value of their land. Private traders have equal rights to purchase rice from the farmers, the food grain prices now are equal in the government supply stores and in the free markets. In practice, the state companies have a high demand of paddy for processing for export and for the national food security program.

Decentralisation of input supplies

Prior to 1988, retail traders in agricultural inputs had been controlled by the state trading corporations and the input buying and selling co-operatives. The total supply of inputs was never enough to meet demand.

In the later half of 1988, input supplies were being handled by the provincial authorities rather than the central government, this also included imports of inputs. Several provinces in the South had started importing fertilizers by using their own export earnings or through bilateral programs. Farmers with financial resources were also allowed to own mechanical equipment and draft animals.

Ordinance number 193 issued on 23rd December 1988 indicated that individual traders could also handle input marketing. However, input-import procurements had still to be done by the state import-export agencies and foreign exchange allocations were still highly controlled by the state.

3.4.4 Rice Market Liberalization (1989)

Some of the shortcomings discussed above were corrected through a series of reforms introduced in 1989. The most important reforms were: i) assigning farmers long term, inheritable leases on their land; ii) replacement of the contract system by a land tax system, which meant that farmers were no longer required to sell a large part of their output to the state at a low price; iii) privatization of the agricultural output market; iv) decentralization of input supplies; and v) removal of the food grain subsidy given to government employees and the army.

***Immediate Impact**:* These reforms resulted in a sudden and massive increase in rice exports. In early 1989, when the food grain subsidy was removed, the price of rice in the government stores was the same as the private market price. The quality of rice sold in government stores however was much poorer than privately sold rice, since farmers traditionally met their quota obligations through lower quality grain. Since there was no longer a price advantage, the former recipients of food grain subsidies quickly moved to purchasing grain from the private market. Government stocks were then put on the international market by mid-1989. Between June to December 1989, approximately 1.3 million tons of rice were exported out of Vietnam; the exports for the entire year of 1988 were only 108 thousand tons (IRRI, 1991) (See also Table 3.8).

Table 3.8. *Milled rice supply, export, and consumption, 1980-2000 (Thousand tons)*

	1980	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total supply [(1)]	4,871	6,128	7,308	8,179	8,388	8,788	9,645	10,242	10,662	11,189	12,747	13,112	13,874	14,942	15,495
Import (+) or Export (-)	177	203	347	-1,317	-1,458	-1,055	-1,953	-1,649	-1,962	-2,025	-3,047	-3,682	-3,793	-4,550	-3,500
Reserved stock variation [(2)]		159	-293	320	153	-163	138	na [(3)]	na	na	na	na	na	na	na
Available for consumption	5,048	6,490	7,389	7,182	7,083	7,570	7,830	8,520	8,700	9,164	9,700	9,430	10,081	10,392	11,995
Population (mil. Persons)	53.7	62.4	63.7	64.7	66.2	67.6	69.3	71.0	72.5	73.9	75.2	76.7	78.1	79.5	80.9
Per capita availability (kg)	94.0	104.0	116.0	111.0	107.0	112.0	113.0	120.0	120.0	124.0	129.0	123.0	129.0	131.0	148.0

Note: [(1)] Total paddy output minus 30 percent accounted for post harvest losses, seed and other uses of household farmers (food for animal) The conversion ratio from paddy to milled rice was 65 percent on average.
[(2)] Volume of paddy rice stored at national warehouses for food security program.
[(3)] Not available.

Source: Ministry of Agriculture and Rural Development (2000)

The private market price of rice rose rapidly due to the sudden shift in demand and due to the large scale de-stocking of publicly held rice. The domestic rice price, which in early 1989 was USD 125/ton lower than the world market price[16], equaled the world price by mid-1990 and was substantially higher than the world price through August 1991 (Khiem and Pingali 1995). Since the purchase of food grains from farmers was also privatized in 1989, the farm-gate price rose rapidly in response to the exports-induced shift in demand. In the South, the farm gate price for the wet season harvest rose from USD 5.80 per 100 kilograms of paddy in 1989 to USD 7.50 per 100 kilograms in 1990 and has leveled off at USD 8.50 per 100 kg in 1991 and 1992. Rice sales by the Southern households responded predictably, rising from 2.7 tons/year in 1989 to 6 tons/year in 1990 and 7.5 tons/year in 1992 (Table 3.9). Total sales rose from 40 percent of total production in 1989 to 66 percent in 1992. Even in the North, rice sales though modest went up from 95 kilograms per household in 1989 to 162 kilograms per household in 1992.

Did the additional export volume come from an increase in rice production or at the cost of consumption? In the first and second year of market liberalization (1989-90), rice exports may have come at the expense of domestic consumption, especially in traditionally food deficit areas such as Northern and Central Vietnam. This can be concluded from the substantially higher prices in Northern Vietnam relative to the price in Ho Chi Minh City in the early years. Since 1991 however, regional price differences, after accounting for transport costs, were not significantly different (Barker, 1994).

Policy reforms and the restoration of producer incentives have resulted in significant shifts in yield in both the Red River and the Mekong Delta areas. Under the contract system, farmers obtained 30 percent higher yields than under the collective system. Further liberalization of the rice market lead to additional yield gains of 54 percent. Yield gains have occurred mainly in the irrigated environments where modern rice varieties are widely used. (Khiem and Pingali, 1995)

Land policy: Land reallocation and promulgation of the new land law is the most important component of policy reforms in agriculture. It is recalled that in 1981, the contract system replaced the collective system as farmlands were allocated to households with the obligation to turn over to the state a contracted level of output at a fixed price. Although this shift from a fixed wage to a fixed rent system (tax system) of production increased efficiency in management decisions and work efforts, the lack of tenure security, low output price, and inadequate input supplies constrained further growth in productivity.

[16] The world market price of rice was calculated based on Thailand's export price.

Table 3.9 *Rice production performance, sample farm data, Red River Delta and Mekong River Delta, Vietnam, 1989-1992.*

	Northern Vietnam			Southern Vietnam			
	1990	1991	1992	1989	1990	1991	1992
No. of farms							
Wet season	207	167	171	100	90	100	102
Dry season	184	158	158	102	85	102	104
Ave. yield (*) (t/ha)							
Wet season	3.70	3.98	3.74	4.02	4.08	3.96	4.53
Dry season	4.43	2.40	4.42	4.91	5.18	5.40	5.68
Ave. land area per household (ha)	0.25	0.25	0.25	1.00	1.20	1.24	1.20
Rice cropping intensity	1.59	1.66	1.66	1.47	1.74	1.84	1.85
Rice prod./ household (kg)/year	2,033	1,595	2,040	8,920	9,260	9,360	10,210
Rice sold per household (kg)	95	112	162	2,659	5,918	5,475	7,555
Net prod. (kept for consumption, seed,..)	1,938	1,483	1,878	6,261	3,342	3,885	2,655
Average farm gate price (USD/100 kg)							
Wet season	9.20	14.60	9.80	5.80	7.50	8.30	8.60
Dry season	9.70	16.90	11.40	8.10	9.70	8.80	9.50

Note: (*) Average yield: annual production per hectare. (The data in 1998 in Northern Vietnam are not available)
Source: Farm survey 1989-93, International Rice Research Institute, Los Banos, Philippines, CanTho University and HaNoi Agricultural University – IRRI, Annual Report 1994.

By 1988, long-term cultivation rights from 15-25 years and transferable within the family were granted to households. However, the prohibition of private land transfer and the limitation of the tenure period discouraged market transactions of land and reduced incentives for private investments for land conservation and improvement. In order to overcome these problems, regulations on land tenure were revised in the Land Law of 1993 (approved by the National Assembly in July 1993). The Law allows the holders of land use titles five rights: "exchange, transfer, inheritance, lease and mortgage", conditional to the payments of tax for such transfers. The 1993 Land Law represents a major advancement on the reform of land property institutions for promoting market-oriented economic development. If this Law is appropriately administered, household land-use rights may become, in effect, essentially the same as private property rights in developed market economies even though state ownership is maintained (Hayami, 1994). To insure the titling of land use rights to individual households, land-use certificates are being issued based on cadastral surveys.

Even prior to the enactment of the Land Law of 1993, de-facto transactions of lands were carried out, especially by farmers in the Mekong Delta. Farmer to farmer land transactions took one of the following forms. Outright purchase of lands conducted with written contracts witnessed by another villager but without legal sanction. Short-term land mortgage commonly arranged between farmers under the terms that the mortgage giver obtains a share of the output from lands as interest. Mortgage amount is always valued in gold equivalence, a way to insure against the risk of inflation. Land leasing was also possible - seasonal or permanent - under fixed rent arrangement. Land has also been used as collateral in the informal credit market.

3.5 Trend in rice production

Table 3.7 in the previous section has summarized the growth of area and yield of rice from 1950 to 2000. Although the rice cultivated area increased at the rate of 1 percent from 1976 to 1980, the total production stagnated at the level of 11 million tons (Table 3.1). Rice production in the period 1981-87 was marked by a sharp increase in yield and in output (3.23 and 3.14 percent per annum respectively). Total rice production increased at 5 percent yearly in the period 1988-96 of which area accounted for nearly 2.4 percent and yield 2.8 percent of the rate. In the latest period 1997-2000, total rice production continuously increased at 5.77 percent per year, of which the growth in rice yield also contributed more than the cultivated area. Figure 3.3 (page 53, Section 3.4.2) shows the production and area trend of rough rice for the period 1976-2000. Expansion of rice areas of the period came mainly from the conversion of single to double rice cropping in the Mekong River Delta (Table 3.10 and Figure 3.4). Reclamation of marginal land in the delta since 1975 has increased arable land by only 10 percent, but area planted to short duration, high-yielding rice varieties has increased more than three times. Rice area in the Mekong River Delta increased 583 thousands hectares from 1987 to 1992 (Table 3.10), in which 183 thousands hectares were from clearing new land and 400 thousands hectares from shifting of cropping practice.

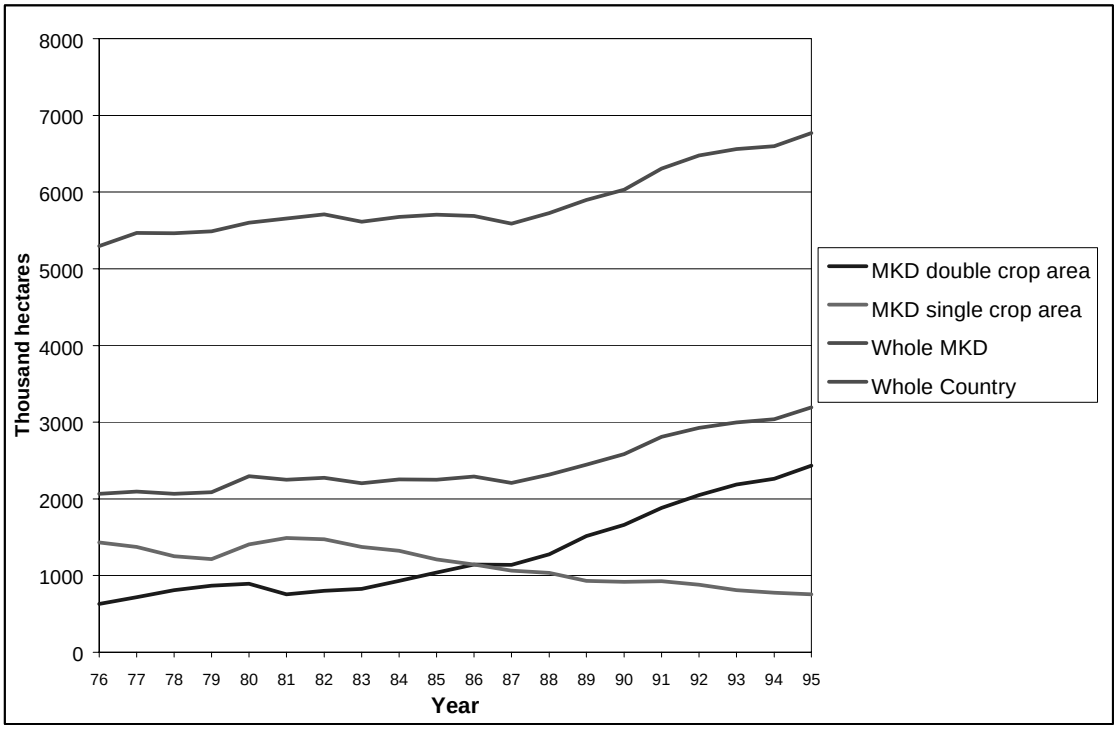

Figure 3.4 *From single to double rice cropping in the Mekong River Delta, 1976-1995*

Source: General Statistic Office, Hanoi 2000.

The following paragraphs summarize the distribution of rice areas and rice growing environments in the two main rice production regions: the Red river Delta in the North and the Mekong River Delta in the South of Vietnam. Trends in rice areas and yield for each region is presented.

3.5.1 The Red River Delta*:* This 1.7 million hectares of lowland is composed mainly of degraded riparian alluvium soil. Landholdings of the delta are the smallest in the country and the region has the highest population density of about 844 persons per km^2. There are about 626 thousand hectares of rice land or 14.8 per cent of the country total with a total sown areas of 1.03 million hectares producing 4.1 millions tons of paddy in 1994. The rice-sown area of the Red River Delta remained almost at a same level since 1960. Rice yield increased 2.6 per cent per year during the period 1955-70, 3 per cent in the period 1970-1976, -4.7 per cent in the period 1976-1980, 3 per cent in the period 1980-1987 and 6.5 per cent in the period 1987-1992 (Khiem and Pingali, 1995).

Table 3.10 *Total harvested rice area by traditional and modern varieties of the Mekong Delta and Vietnam. (Thousand hectares)*

Year	MKD modern varieties	MKD traditional varieties	Mekong River Delta total	Red River Delta total	Country total
1976	631.0	1,431.6	2,062.6	3,234.7	5,297.3
1977	719.1	1,375.2	2,094.3	3,374.4	5,468.7
1978	808.9	1,253.6	2,062.2	3,400.3	5,462.5
1979	870.3	1,215.8	2,086.0	3,399.2	5,485.2
1980	890.5	1,405.7	2,296.1	3,304.1	5,600.2
1981	754.8	1,491.6	2,246.6	3,405.3	5,651.9
1982	801.4	1,474.1	2,275.4	3,436.0	5,711.4
1983	828.0	1,373.8	2,201.9	3,409.1	5,611.0
1984	929.6	1,323.9	2,253.5	3,421.5	5,675.0
1985	1,042.1	1,208.7	2,250.8	3,453.1	5,703.9
1986	1,146.5	1,144.9	2,291.4	3,397.2	5,688.6
1987	1,139.9	1,066.7	2,206.6	3,381.9	5,588.5
1988	1,278.0	1,035.8	2,313.8	3,412.6	5,726.4
1989	1,514.7	930.0	2,444.8	3,451.0	5,895.8
1990	1,660.1	919.9	2,580.0	3,447.7	6,027.7
1991	1,878.5	928.5	2,807.0	3,495.7	6,302.7
1992	2,047.0	877.7	2,924.7	3,550.7	6,475.4
1993	2,185.1	808.0	2,993.1	3,566.3	6,559.4
1994	2,261.4	776.5	3,037.9	3,560.6	6,598.5
1995	2,433.3	757.3	3,190.6	3,575.0	6,765.6

Note: In the Mekong Delta, the "*Mua*" rice crop is mainly of traditional varieties being replaced by modern varieties that are grown two or more crop a year. The data from 1996 up to now are not available.

Source: General Statistical Office and National Institute for Agricultural Planning and Projection, Hanoi, 1991; Agricultural Statistics 1985-1995, General Statistical Office, Hanoi.

3.5.2 The Mekong River Delta: The monsoon rains combined with the high flow of the Mekong river during September-October cause annual floods on the entire Delta. In depressed areas, the annual flood may reach 80 to 200 cm deep, while the back swamps behind the coastline are inundated to about 50 cm. On the contrary, during the dry season, the water table moves deep into the soil profile, causing localized drought. The Mekong delta soils are young alluvium, about 40 percent of which is affected by acid sulfate soils and seasonal saline soils. This region is the rice bowl of Vietnam, 45.3 percent of rice land is found in the region (1.923 million hectares). Sown area in 1994 was 3 million hectares (Table 3.10 with an output of 12 million tons. Growth rate of rice-sown area of the region during the period 1978-90 was 1.9 percent per annum while the growth rate of rice output of this period was 6.7 percent. Yield increased 4.6 percent per year during this period. Mekong Delta has 73 thousands hectare or 1.4 percent of 3.9 million hectares in triple cropping, nearly a million hectares in rice double cropping. Nineteen percent or 742 thousands hectares of the total area in rice single cropping; this is the area which has the potential for shifting to double cropping (Khiem and Pingali, 1995).

Rice production performance observed for two groups of rice farmers in the Red River and the Mekong Deltas are presented in Table 3.10. Sample rice farms have been monitored for five consecutive years since the start of liberalization policy in 1989. Yield trends from farm data confirm observed regional trends. Areas planted to rice in the RRD remain at the same level during the last twenty years while shifting from traditional rice to modern varieties and from single to double or triple cropping in the MKD resulted in rapid expansion of rice sown areas.

In summary, the above sections have reviewed rice production as well as the progress of rice market liberalization in Vietnam. This information is used as a necessary background for developing the suitable methodology to analyze the rice marketing in Vietnam.

3.6 World rice production and trading

Rice exports from Vietnam are often cited as the success story of agricultural policy reforms. Since 1989, Vietnam has been exporting one to two million tons of rice, making it the third largest exporting country in the world. Vietnam's re-acquired status as a rice exporter came as a surprise since it had been a net importer of rice since 1968. Therefore, in analyzing Vietnam's rice market, we ought to consider and examine briefly the world rice markets, including world rice production, consumption, and Vietnam's rice competitors. The information on the world rice markets will help the Vietnamese government develop a suitable rice export strategy and also manage the domestic rice markets efficiently.

3.6.1 World rice production, consumption and trade

Period of 1970-1989

As shown in Table 3.11, world rice production fell in 1973 by more than 3 percent while consumption of the same year fell less than 2 percent. Fortunately, world rice production recovered quickly in the following year, increasing by 9.09 percent while world consumption increased by only 4.69 percent leading to stockpile of 5 million tons - nearly 20 percent of the world rice stock in the early 1970s (Table 3.11). During the rest of the 1970s, world rice production exceeded world consumption in most years making world rice stock double in 1980 as compared to 1970 (from 26.4 million tons in 1970 to 53.7 in 1980).

Table 3.11 *World rice production, consumption, stock and trade, 1970-1989*

Year	Production (million tons)	Annual growth rate (%)	Consumption (million tons)	Annual growth rate (%)	Trade (million tons)	Annual growth rate (%)	Stock (million tons)
1970	210	-	199	-	8.2	-	26.4
1971	213	1.43	211	6.03	8.6	4.65	28.8
1972	216	1.41	217	2.84	8.7	1.16	28.0
1973	209	- 3.24	213	- 1.84	8.4	- 3.45	23.8
1974	228	9.09	223	4.69	7.7	- 8.33	28.8
1975	276	1.05	227	1.79	7.3	- 5.19	28.0
1976	243	- 11.96	232	2.20	8.4	15.07	38.8
1977	236	- 2.88	237	2.16	10.6	26.19	37.8
1978	251	6.36	244	2.95	9.6	- 9.43	44.2
1979	262	4.38	253	3.69	11.9	23.96	54.1
Average 70-79	*234*	*2.48*	*226*	*2.70*	*8.9*	*4.20*	*33.9*
1980	257	- 1.91	257	1.58	12.5	5.04	53.7
1981	270	5.06	275	7.00	12.7	1.60	48.5
1982	278	2.96	283	2.91	11.5	- 9.45	43.3
1983	285	2.52	285	0.71	11.5	0.00	43.6
1984	307	7.72	303	6.32	11.5	0.00	47.9
1985	317	3.26	309	1.98	10.7	- 6.96	55.6
1986	318	0.32	319	3.24	11.7	9.35	54.4
1987	316	- 0.63	320	0.31	12.8	9.40	50.7
1988	315	- 0.32	321	0.31	11.2	- 12.50	44.7
1989	331	5.08	327	1.87	13.9	24.11	48.8
Average 80-89	*299*	*2.85*	*300*	*2.71*	*12.0*	*1.18*	*49.1*
Average 70-89	*254.2*	*1.66*	*250.2*	*1.36*	*9.9*	*4.98*	*39.5*

Note: Annual growth rate (previous year = 100 %). Average growth rate for 20 year period (1970 –1989)
Source: Ministry of Trade of Vietnam, World Rice Production, Consumption and Stock, 1999.

The 1980s witnessed a slight increase in rice production with a growth rate of 2.85 percent per year on average compared to 2.48 percent per year on average during the previous decade. However, during 1980-1989 the average annual growth rate of world rice consumption was 2.71 percent, almost the same as production growth rate (2.85 percent). World rice stocks during the 1980s remained at higher levels (45 –50 million tons) than in the previous decade. Therefore, it can be said that the world produced enough rice to meet its growing consumption demand in the 1980s.

The above overview of the world rice supply and demand conditions during the 1970-1989 period allow us to conclude that world rice production not only caught up with world rice consumption but also allowed for an increase in world rice stocks.

Period of 1990-1998

Table 3.12 shows that world rice production growth rates slowed down to only 1.39 percent per year during 1990-1998 period. The reasons for such slowdown were slow yield growth, and almost no area expansion. [17] During the same period, world rice consumption also slowed down to 1.6 percent compared with the previous period but to a lesser extent than world rice production. Compared to the beginning of the decade, world rice stocks declined considerably from roughly 16 percent of world consumption in 1990 to 13.6 percent in 1998 (calculated from Table 3.12). Thus, during 1990s, although world rice production still continued to increase, world consumption increased at a faster rate leading to shortfalls of rice during the decade.

Table 3.12 *World rice production, consumption, stock and trade, 1990-1998.*

Year	Production (million tons)	Annual growth rate (%)	Consumption (million tons)	Annual growth rate (%)	Trade (million tons)	Annual growth rate (%)	Stock (million tons)
1990	344	-	338	-	11.4	-	54.3
1991	352	2.33	347	2.66	12.1	6.14	58.9
1992	355	0.85	356	2.59	14.1	16.53	57.2
1993	356	0.28	358	0.56	15.1	7.09	55.0
1994	356	0.00	359	0.28	16.7	10.60	51.9
1995	365	2.53	367	2.23	21.0	25.75	50.1
1996	372	1.92	371	1.09	19.5	- 7.14	49.9
1997	380	2.15	377	1.62	19.0	- 2.56	50.6
1998	384	1.05	384	1.86	27.5	44.74	52.3
Average 90-98	*362.7*	*1.39*	*361.9*	*1.61*	*17.4*	*11.64*	*53.4*

Note: Annual growth rate (previous year = 100 %). Average growth rate for 9 year period (1990–1998)
Source: Ministry of Trade of Vietnam: World Rice Production, Consumption and Stock, 1999.

It is interesting to note that during this decade, world rice trade increased much faster than in the previous period. At the same time, world rice trade seemed to fluctuate much more than in the previous period (See Tables 3.11 and 3.12). The year 1998 was an outstanding phenomenon. During that year, the El Nino caused unfavorable weather in many countries, such as Indonesia, the Philippines, Bangladesh, and Brazil, which substantially reduced rice production in those countries. Nonetheless, many other countries, such as China, India, Vietnam, and Thailand, enjoyed good harvests in 1998 and increased their rice production. World rice production, therefore, did not decline but instead increased by 4 million tons allowing the world to meet its substantial increase in rice consumption in this year. Rice trade in 1998, therefore, rose to a record high level of 27.5 million tons. Because the weather has become normal for most part of the

[17] USDA, 1998.

world in early 1999, rice trade in 1999 is expected to reduce to its normal level of 22 million ton. [18]

Prospects of world rice market

Total world rice area harvested is projected to increase only slightly to 148 million hectares by 2003 from a 1992 base of 145 million hectares. The world average yield of rice was about 2.42 tons per hectare in 1992, and is projected to be 2.74 tons per hectare by 2003. Consequently, total production is projected to increase from 351 million tons in 1992 to 405 million tons by 2003. [19]

Total world consumption is projected to increase at the same rate as total production, from 354 million tons in 1992 to 407 million tons by 2003. For some Asian countries, rice has become an inferior good, while for other countries including some industrialized market economies it is still a normal good. Ending stocks are projected to decline from 51.4 million tons in 1992 to 43.8 million tons by 2003.

World rice net trade is projected to increase only marginally from 11.6 million tons in 1992 to 14.6 million tons by 2003. Net trade as a percentage of total production is projected to increase slightly from 3.3 percent in 1992 to 3.6 percent by 2003. The international rice market is projected to remain thin. [20]

In summary, the past trends of world rice supply and demand and the above predictions on future demand and supply allow us to say that in the near future, the world may face difficulties in meeting its rising demand for rice. However, whether this will turn into a "food crisis" [21] or "the world can feed twice as many in twenty years" depends heavily on the changes in supply and demand determinants. [22] Given the volatile nature of both supply and demand in the world market, it becomes more and more difficult to give projections on changes in the world rice market. However, if investments in agriculture are promoted, prospects for the rice market in the longer-run will be optimistic.

3.6.2 Major rice-exporting countries

The figures from Table 3.13 show the volume of rice exported from different regions of the world during the 1989-1999 period. This table indicates that Asia has been the most important source of rice export of the world. In Asia, there are

[18] USDA, 1999.
[19] Wailes and Cramer, 1994.
[20] International Baseline Projections, Arkansas Rice model, Wailes and Cramer, 1994.
[21] Pingali, P.L., *et al*., 1997.
[22] Mitchell, D.O., *et al*., 1997.

at least 10 countries that have appeared in the world rice market as either usual or occasional rice exporters. On average, Asia exported 70 percent of total world rice export. Most of the world's leading rice exporters, such as Thailand, Vietnam, India, Pakistan, Burma, are situated in the Asian region.

Table 3.13 *Rice exports by region, 1989-1999 (Million tons)*

Regions	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Asia	9.4	7.4	8.3	9.7	10.5	11.8	15.5	14.4	13.8	21.5	15.8
America	3.5	3.3	3.5	3.3	3.6	3.8	4.3	4.0	4.0	4.6	4.6
Oceania	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7
Africa	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.3
Europe	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2
World	*13.9*	*11.4*	*12.1*	*14.1*	*15.1*	*16.7*	*21.0*	*19.5*	*18.9*	*27.5*	*21.6*

Source: F.A.O – Food Outlook Statistics Supplement, 1999.

The following paragraphs will provide some basic information of major exporting countries

Thailand*:* Thailand has been exporting rice for more than a century and has a very large market of 125 countries all over the world. Recently, Thailand exported 5-6 million tons of rice to the world market, taking the highest rank. Thai rice competes in all segments of the rice market: high, medium, and low quality. In the near future, the harvested area is expected to increase from 9.4 million hectares in 1992 to 9.9 million hectares by 2003. Yields forecasted in Thailand are determined by further adoption of high-yielding varieties, costs of production, and weather factors. Total per capita rice use in Thailand was 149 kilograms in 1992 and is projected to decline steadily to 136 kilograms by 2003 as per capita incomes rise and dietary habits change. Thailand is projected to maintain its status as the largest rice exporting country; total rice export is projected to increase to 5.0 million tons by 2003.

India: Since 1995, India exported considerable amounts of rice to the world market and ranked second among the world's leading rice exporters twice in 1995 and 1998. However, increase in domestic consumption, already tight stocks and a slight drop in production is resulted in smaller exports in 1999. India is a major parboiled rice exporter, its main rice export market is the Middle East. However, in the low and medium quality rice markets, India's rice is not as price competitive as Vietnam because of India's high transportation cost and lower quality rice (USDA, 1999). Despite these difficulties, India is expected to sustain its position as a major rice exporter at least several years from now and will remain an important competitor of Vietnam.

Africa is the second largest rice importing region of the world. Every year, Africa accounted for slightly more than 20 percent of the world's total rice import. It is necessary to note that most of the African rice importers are low income countries and thus had to depend on both rice aid and rice imports. Therefore, high demand for rice imports, low income levels and limited foreign exchange are worth noting if Vietnam is to exploit these markets further.

Table 3.14 also indicates that while Asia, Africa and Latin America show upward trends for rice imports, Europe and the Oceania are stable importers during the period 1989-1999.

Table 3.14 *Rice imports by region and principal countries, 1989-1999 (Million tons)*

Regions and Countries	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
ASIA	*7.20*	*4.90*	*4.40*	*5.80*	*6.40*	*8.10*	*12.60*	*9.70*	*9.20*	*17.40*	*12.20*
Indonesia	0.40	0.05	0.20	0.60	0.03	0.60	3.20	1.60	1.00	6.00	2.50
Bangladesh	0.30	0.01	0.04	0.03	0.01	0.20	1.30	0.50	-	2.50	1.30
Philippines	0.20	0.60	0.10	0.20	0.50	-	0.30	0.90	0.90	2.20	1.20
Saudi Arabia	0.70	0.60	0.70	0.80	0.90	1.00	1.10	1.00	1.00	0.80	0.80
Japan	0.20	0.10	0.20	0.20	0.20	2.30	0.20	0.50	0.60	0.60	0.70
Malaysia	0.40	0.30	0.40	0.60	0.40	0.30	0.40	0.60	0.60	0.60	0.70
Iran	0.80	0.90	0.70	0.80	1.10	0.50	1.30	1.30	0.90	0.50	0.70
China	1.20	0.06	0.07	0.10	0.10	0.80	2.00	1.10	0.60	0.50	0.90
AFRICA	*3.20*	*2.90*	*3.30*	*2.80*	*3.70*	*3.40*	*3.30*	*3.70*	*4.30*	*4.10*	*4.10*
Sub-Sa. Africa	3.10	2.90	3.20	2.70	3.50	3.20	3.20	3.60	4.10	3.90	3.90
North Africa	0.10	-	0.10	0.10	0.20	0.20	0.10	0.10	0.20	0.20	0.20
AMERICAS	*1.50*	*1.60*	*2.20*	*2.60*	*2.70*	*2.90*	*3.10*	*3.20*	*3.40*	*4.20*	*3.50*
South America	0.50	0.70	1.10	1.30	1.30	1.40	1.30	1.40	1.40	2.20	1.50
Central America	0.70	0.60	0.80	1.00	1.00	1.10	1.30	1.30	1.40	1.40	1.40
North America	0.30	0.30	0.30	0.30	0.40	0.40	0.50	0.50	0.60	0.60	0.60
EUROPE	*1.10*	*1.00*	*1.10*	*1.20*	*1.20*	*1.30*	*1.10*	*1.00*	*1.20*	*1.10*	*1.10*
OCEANIA	*0.20*	*0.20*	*0.20*	*0.20*	*0.30*	*0.30*	*0.30*	*0.30*	*0.30*	*0.30*	*0.30*
WORLD	*13.9*	*11.4*	*12.1*	*14.1*	*15.1*	*16.7*	*21.0*	*19.5*	*18.9*	*27.5*	*21.6*

Source: F.A.O – Food Outlook Statistics Supplement, 1999.

In the near future, the demand of rice import of some major countries are projected as follows:

***European community**:* the EC is important both as an importing and an exporting region. Total production is projected to increase from 1.5 million tons in 1993 to nearly 1.7 million tons by 2003. Total consumption also is projected grow from 1.8 million tons in 1993 to 2.0 million tons by 2003. Net imports are projected to remain in the range of 330 thousand tons to 380 thousand tons per year during the same period.

Indonesia is projected to continue its policy of self-sufficiency, and therefore net imports are projected to be minor in future.

Iran: total consumption is projected to continue demonstrating strong growth as per capita incomes rise and the population increases. Iran is projected to remain a rice importing country. Projected imports increase from 644 thousand tons in 1993 to slightly over 1.0 million tons by 2003.

***Saudi Arabia**:* since Saudi Arabia has virtually no rice production, its rice supplies come from imports. Total consumption is projected to increase steadily from 680 thousand tons in 1993 to slightly over 1.0 million tons by 2003. Saudi Arabia is expected to continue importing nearly all of its rice requirement.

The Rest of the World is a net importer. Consumption is responsive to the world rice price (Thai FOB), income growth, and taste changes. Total harvested area is projected to remain constant, while yields are projected to grow from 1.94 tons per hectare in 1993 to 2.36 tons per hectare by 2003. Total production is projected to increase from 58.2 million tons to 70.9 million tons during the same period. Total consumption is projected to increase from 67.1 million tons in 1993 to 82.5 million tons by 2003. Hence, the rest of the world is projected to increase its net imports from 9.5 million tons in 1993 to 11.7 million tons by 2003.

The above features of rice importers give us a relatively clear picture of the demand side of the international rice market. Asia has been the largest rice exporting and importing region of the world. At the same time, Asia has also been the major source of fluctuations in world rice trade over the past ten years. The large number of importers and the instability of their import need indicate that none of the deficit countries dominate demand in the world market. Besides, increasing rice import means that countries in the world are becoming more and more dependent on the international rice market.

We conclude that the international market provides opportunities for the Vietnamese exporters. However, the market is volatile and competition is fierce. Vietnam needs to develop a proper export strategy in order to be successful in this market in the long run. We recall that this study focuses on the domestic market. Further studies are needed to develop such a strategy.